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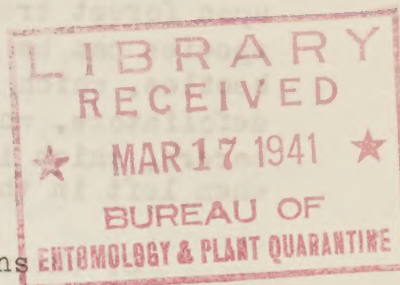
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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

ANNUAL FOREST INSECT STATUS REPORT
IDAHO AND MONTANA
1940

By James C. Evenden
Senior Entomologist
Division of Forest Insect Investigations



INTRODUCTION

Forest industries play a primary role in the security of most urban communities throughout northern Idaho and western Montana, by providing a large percent of the basic manufacturing wages upon which these communities exist. The future of these industries rests upon a permanent timber supply, which depends upon an adequate and properly balanced forestry program. Such a program must include not only a provision for growing future timber crops but the proper protection of existing merchantable timber stands from which present supplies are drawn.

Unfortunately this natural resource which has contributed so much to the development of this region is rapidly diminishing in volume. The annual cut of white pine, which is the timber species upon which the industry of this region depends, is in excess of the present annual growth. To add to this unsatisfactory condition forest insects take from the forests of Idaho and Montana an additional annual toll which has equaled the volume cut for lumber. With white pine alone this loss amounts to 91,000,000 B.F. annually, or 25 percent of the amount cut each year for lumber, which reduces proportionately the life of industries essential to the economic stability of the region. This loss is reflected upon the communities in the destruction of timber, changes of stand composition requiring new plans of forest management, and increases in the difficulty, expense, and danger of fire control, and often leaves valuable forest areas in such condition that the residual timber stands are of insufficient value to warrant the expense of logging.

The first step in all programs of artificial control directed towards the prevention of excessive losses of commercial and scenic timber resulting from insect attack is the detection of potentially dangerous infestations while in their early stages. In attempting to provide for this essential requirement the Forest Insect Laboratory at Coeur d'Alene, Idaho, takes advantage of all available sources of information in addition to a regular program of insect surveys. The annual reports from the ranger districts of the Forest Service and National Park Service constitute a valuable source of information toward this requirement. As all timbered areas can not be covered by survey each year, such reports serve as the only source of information between periods of more intensive surveys and are invaluable to the building of a reliable picture showing the annual status of insect conditions throughout the region.

It is fortunate that only a few of the many insects that feed upon forest trees and shrubs are of primary importance. These few species can be grouped into three broad classifications, namely, bark beetles, which feed between the bark and wood of healthy mature trees; defoliators, which feed upon the foliage of forest trees and shrubs; and borers, which injure such crude forest products as logs, poles, etc., when left in the woods during summer months.

Of the many species of bark beetles found within the forests of these two states the mountain pine beetle, the western pine beetle, the Douglas fir beetle, and the Engelmann spruce beetle are of the greatest importance. In addition to its destructiveness in white pine, the mountain pine beetle has since 1925 destroyed 38 percent of the original merchantable volume of lodgepole pine present in Idaho and Montana at that time. The loss of ponderosa pine from attacks of the western pine beetle has during the past ten years been more than two-thirds of the volume cut for lumber, while the Douglas fir beetle and Engelmann spruce beetle have destroyed volumes of their respective hosts far in excess of the annual lumber cut.

Different species of defoliating insects appear from time to time in different parts of the region. During epidemics of these insects a severe toll is taken from the host tree peculiar to each insect species. Fortunately most of these outbreaks last only a short time and are soon restored to a properly balanced condition by natural factors of control. The most serious defoliating problem now present in this region is an invasion of the eastern larch sawfly, which has during the past few years become definitely distributed throughout the larch stands of Idaho and western Montana.

There are a number of different wood-boring insects that are always present in the woods to attack crude products left during the summer months.

The Forest Insect Laboratory, Coeur d'Alene, Idaho, is responsible for making surveys of damage to commercial and scenic forests, and for recommending on the need for control operations and the methods of control. This responsibility calls for fundamental studies of insect problems to provide for the development of economical methods of control and the dissemination of accurate information. In meeting a phase of the service obligation a summary of all available information concerning the status of forest insect conditions within the States of Idaho and Montana is prepared each year and made available to all agencies interested in the forest resources of the northern Rocky Mountains. This summary, "Annual Forest Insect Status Report", includes those insects considered as being of secondary importance, as well as primary species, in order that the picture may be complete.

SUMMARY TABULATION OF RANGER REPORTS
RECEIVED FROM THE FOREST RANGERS OF REGION 1

The importance of these reports must not be minimized. Forest insect infestations change from normal to epidemic conditions so quickly that serious losses often occur before the situation is recognized. In view of this fact, officers of all land-managing agencies should accept the responsibility of reporting to this office all unusual insect situations, or apparent changes in existing conditions. Past reports of this nature have contributed valuable information, which has served in building a picture of insect conditions within the region as well as a guide for more intensive examinations and surveys. It is trusted that all officers will continue this service with even more detailed and accurate reports.

SUMMARY OF FOREST RANGER REPORTS RECEIVED
REGION 1

	1938	1939	1940
Number of forests reporting.....	17	16	17
Number of ranger districts reporting.....	91	94	81
Number of insect infestations reported.....	162	143	104
Number of reports depicting no infestations.....	7	16	28
Number of Dendroctonus reports.....	100	93	64
Number of fir engraver beetle reports.....	1	1	3
Number of spruce budworm reports.....	7	6	3
Number of hemlock looper reports.....	26	12	8
Number of larch sawfly reports.....	5	10	11
Number of miscellaneous reports.....		21	15
Increasing infestations.....	42	15	24
Decreasing infestations.....	49	43	39
Normal infestations.....	53	66	35
Infestations reported as no longer existing.....	17	18	6
Status of infestation unknown.....	1	1	0

SUMMARY OF MISCELLANEOUS INSECTS REPORTED

Western Balsam Bark Beetle (Dryocoetes confusus Sw.)

Yellowstone National Park, Beaverhead National Forest

Increasing infestation of this insect in all alpine fir areas throughout the park. Widespread infestation and severe damage in Wise River drainage with heavy losses (75 percent of stand) occurring in some areas. Infestations of this insect are quite common along the high elevations of the northern Rocky Mountains, where large numbers of mature trees have been killed. As this tree species is of a low commercial value, and as there is a dense understory associated with all mature timber stands, these losses are of little economic importance.

Oregon Pine Engraver (Ips oregoni Eichh.)

Bitterroot and St. Joe National Forests

Sporadic outbreaks of the Oregon pine engraver are quite common throughout the ponderosa pine stands of the region, and are in most instances associated with freshly created slash. These outbreaks are short-lived and by the time the damage becomes apparent the danger of subsequent loss is passed. A 1939 outbreak of this insect in the Moose Creek area of the Bitterroot was reported as non-existent. Spots of infestation were reported from the Moscow Mountain and Palouse River areas near the St. Joe National Forest.

Fir Engraver (Scolytus ventralis Lec.)

Cabinet and Flathead National Forests

A decreasing infestation of this insect was reported again from the Thompson Falls district of the Cabinet Forest, while the situation on the North Fork district of the Flathead Forest was considered as being quite severe. Losses from the attack of this insect are quite common but fortunately are of little economic importance.

Spruce Gall Aphid (Adelges cooleyi Gill.)

Cabinet, Nezperce, and St. Joe National Forests.

This insect is found throughout the region, where it does considerable damage to ornamental spruce trees.

Cone Moth (Laspeyresia miscitata Hein.)

Cabinet National Forest

A common insect, which from time to time occurs in rather large numbers.

Cone Moth (possibly Barbara colfaxiana (??))

Yellowstone National Park

Some damage by this insect was reported from the Mammoth, Reese Creek and Lamar districts. This insect is quite common throughout the region.

Woolly Pine Louse (Pineus pinifoliae Fitch)

Cabinet National Forest

This insect is responsible for considerable damage to young white pine trees throughout the region. Rather severe infestations have occurred on the Cabinet (Pilgrim Creek) and Kaniksu (Priest Lake area) National Forests.

Lodgepole Pine Needle Tier (Argyrotaenia pinatubana)

Yellowstone National Park, Custer National Forest

Severe infestations of this destructive insect were reported from Madison Junction of the Yellowstone, and the Heywood and Rock Creek drainages of the Custer. These outbreaks cover large acreages and in the Yellowstone Park there has been a severe loss of young trees during the past few years. In 1921 an outbreak of this insect with an associated epidemic of the lodgepole sawfly (Neodiprion burkei Midd.) resulted in the destruction of a large area of lodgepole pine near West Yellowstone; however, in this instance the sawfly is thought to have been the primary insect responsible.

Pitch Nodule Moth (Petrova albicapitana Busck)

Custer National Forest

A common insect which is of little importance.

Tip Moth (Rhyacionia sp.)

Custer National Forest

An important insect which severely damages young ponderosa pine trees throughout this forest.

Cottonwood Leaf Beetle (Chrysomela scripta F.)

Deerlodge National Forest

Reported from the Nez Perce area of this forest as feeding upon willow.

Lodgepole Needle Miner (Recurvaria (?) sp.)

Lewis & Clark National Forest

Reported as doing considerable damage to small trees within the Birch Creek drainage of this forest.

Pine Midge (Retinodiplosis sp.)

Nezperce National Forest

This insect is quite common throughout northern Idaho and western Montana, where it damages ponderosa pine reproduction by destroying branch terminals.

Twig Borer

Yellowstone National Park

Damage to lodgepole pine (?) twigs by a borer was reported from the Lake-Fishing Bridge and Madison Junction areas. This insect was not identified.

PRIMARY BARK BEETLE INFESTATIONS

Mountain Pine Beetle (Dendroctonus monticolae Hopk.)
in Western White Pine

The forest insect survey program conducted from this laboratory has had as one of its objectives the obtaining of data depicting the status of the mountain pine beetle infestations within the white pine stands of Idaho and Montana. Although these surveys have not been as intensive as considered necessary, they have served to provide the desired information for most areas. This information is used in planning for the institution of control, and in planning subsequent surveys so as to include all potentially dangerous situations.

Clearwater National Forest and Adjacent Private Lands

With the exception of one or two areas there are no serious infestations of the mountain pine beetle in this territory. However, this does not detract from the potential danger of the normal infestation now present in most areas. In the Sheep Mountain unit there is an area of some 1,600 acres on which there are some 600 infested trees. Control measures have been recommended for this potentially dangerous situation.

The status of the general infestation within the white pine stands of this forest and adjacent private lands as revealed by the 1940 survey is shown in the following tabulation:

SUMMARY TABULATION OF THE 1939 AND 1940
INFESTATION OF THE MOUNTAIN PINE BEETLE IN WHITE PINE

Unit Surveyed	Acres	Infested trees per acre	Percent of stand killed	Total infested trees
		1939	1940	1940
CLEARWATER NATIONAL FOREST				
Sheep Mountain	2,880	.29	.23	.3
Dead Horse	1,600	No data	.0	.0
Tepee Creek	1,280	.19	.10	.15
Washington Cr.	2,560	No data	.21	.4
Orogrande Cr.	22,440	" "	.07	.1
Musselshell	32,000	" "	.06	.5
Totals	62,760		.077	

CLEARWATER TIMBER PROTECTIVE ASSOCIATION				
Tepee Creek	640	.17	.16	.3
Washington Cr.	20,000	No data	.17	.3
Orogrande Cr.	12,000	" "	.067	.1
" L.P.P.	*3,720	" "	1.7	No data
Headquarters				
Alder Creek	13,000	" "	.078	.1
Silver Creek	15,000	** .04	.250	.3
Totals	64,360			

* Included in the 12,000 acres

** Data taken on small area

St. Joe National Forest and Adjacent Private Lands

The ranger reports of the past season record light scattered infestations of the mountain pine beetle throughout the white pine stands of the St. Joe National Forest and adjacent private lands. Data obtained from a survey of this region during the past season support this position; however, the potential danger of such light infestations must not be minimized. These data are given in the following table:

SUMMARY TABULATION OF THE 1940 INFESTATION OF
THE MOUNTAIN PINE BEETLE IN WHITE PINE

ST. JOE NATIONAL FOREST

Unit area	Acres	Infested trees per acre	Percent of stand	Total infested trees
Fishhook	6,400	.028	.2	179
North Fork	12,000	.017	.07	204
Twin Creek	3,200	.0	.0	0
	21,600	.026	.1	383

POTLATCH TIMBER PROTECTIVE ASSOCIATION

Floodwood Creek	12,000	.020	.07	140
Isabella Creek	12,000	.0	.0	0
Long Creek	14,000	.041	.1	574
Breakfast Creek	10,000	.018	.1	180
Gold Creek	10,000	.066	.1	660
Clarkia	9,600	.0	.0	0
Maries River	10,000	.0	.0	0
	77,600	.02	.07	1,554

Coeur d'Alene National Forest

In 1930 an epidemic infestation existed in all white pine stands of the Coeur d'Alene National Forest. Control measures were instituted and some 23,000 infested trees treated. Since that time a program of maintenance control has been conducted and all severe "hot spots" of infestation have been treated. Although this control program has not always been as intensive as desired, it has served to prevent the development of devastating outbreaks comparable to those which have occurred in other areas. As a result of this control program it is safe to assume that a large percent of the merchantable white pine of this forest has been preserved. Surveys of this forest during the past 10 years have shown that even with the protection afforded through the program of control the annual loss has amounted to 9,000,000 B.F. This condition is not peculiar to this period, for early reports (Forest Supervisor 1907) record a loss during the preceding decade of 40 to 50 percent of the stand. Although this figure was undoubtedly high, it does indicate the continued seriousness of this problem of forest protection.

SUMMARY TABULATION OF THE MOUNTAIN PINE BEETLE
INFESTATION IN THE WHITE PINE STANDS OF THE COMUR D'ALENE
NATIONAL FOREST IN 1938, 1939 AND 1940

Unit Surveyed	Acres	Infested trees per acre			Percent of stand killed:		Infested trees
		1938	1939	1940	1939	1940	
Honeysuckle	5,320	.059	.147	.15	.9	.7	798
Laverne	2,560	.155	.0	.08	.0	.5	205
Taylor's	2,800	.485	.471	.20	2.7	1.0	560
Forks-Cabin	5,440	.369	.350	.34	1.2	.9	1,850
Can Creek	1,760	.651	.261	.22	1.1	.6	387
West Fork	3,960	.298	.151	.08	.7	.3	317
Clay Creek	2,320	.475	.248	.41	.8	1.0	951
Lower Cougar	3,600	.091	.104	.20	.6	1.2	720
Upper Cougar	3,700	.179	.073	.04	.4	.2	148
Bumblebee	3,040	.342	.114	.13	1.0	.7	395
Sissons	4,700	.356	*.520	.19	1.9	.6	893
Yellow Dog River	2,140	.505	*1.150	.41	3.0	.8	837
Yellow Dog Creek	4,120	.246	*.450	.19	1.1	.3	783
Downey Creek	4,160	.341	*.650	.21	1.8	.5	873
North Yellow Dog	840	.200	*.360	.03	1.2	.1	25
Lower Flat Creek	4,120	.112	.0	.07	.0	.2	288
Bennett Creek	580	.033	.0	.0	.0	.0	0
Brett-Miner	1,550	.016	.0	.0	.0	.0	0
Hawksite	8,780	.075	.01	.07	.1	.5	614
Cabin Creek	7,000	.129	.270	.09	.15	.4	623
Rock City	1,600	.048	.062	.02		.1	
Big Elk Creek	4,960	.054	.048	.07	.3	.5	347
Potter Creek	**1,400	.091	.032	.17	.1	.6	238
Upper Flat Creek	3,680	.242	.025	.05	.1	.4	184
East Eagle	3,540		.10	.04	.8	.3	142
West Eagle	1,280		.08	.07	.5	.3	90

* Control measures applied in fall of 1939.

** Acreage reduced from 3,800 to 1,400 because of logging.

Control measures have been recommended for the Forks-Cabin and Clay Creek units, and will be instituted in May 1941.

Kaniksu National Forest

As the white pine stands of the Kaniksu Forest were all included in the 1939 survey program, this season's activity was directed toward a check survey of a few areas which during the previous season were considered as being potentially dangerous. The data obtained from this check survey are shown in the following table:

SUMMARY OF DATA OBTAINED FROM CHECK SURVEYS
OF SPECIFIC AREAS ON THE KANIKSU NATIONAL FOREST
1940

Unit	Acres	Attacks per acre		Percent of stand killed		Total infested trees	
		1939	1940	1939	1940	1939	1940
Rapid Lightning	1,400	1.22	.46	2.03	.76	1,708	644
Lost Creek	1,300	.98	.21	5.0	1.10	1,275	275
Soldier Creek	9,500	.12	.02	1.0	.30	1,140	228
Hunt Creek	7,900	.16	.0	1.0	.0	1,264	0
	20,100	.27	.06	1.8	.4	5,387	1,147

During the past five years there has been a serious loss of timber within the Rapid Lightning Creek Drainage, which in 1939 amounted to 2.03 percent of the residual stand. Although this season's survey showed a decrease in the severity of this situation, the character of the overwintering broods indicates an increase in severity for the 1941 season. The privately owned lands within this drainage are now being logged, and it is possible that this may have some beneficial influence upon the remaining infestation.

Kootenai National Forest

The 1940 survey revealed a satisfactory condition of the mountain pine beetle infestation in the white pine stands of the Kootenai National Forest. Although not considered as serious at this time, the danger of these so-called normal infestations must not be overlooked. Check surveys will be made as the situations warrant.

SUMMARY TABULATION OF 1940 INFESTATION OF THE
MOUNTAIN PINE BEETLE IN WHITE PINE
KOOTENAI NATIONAL FOREST

Unit	Acres	Infested trees per acre			Total infested trees
		1938	Check 1939	1940	
Pete Creek	2,880	.041		.06	173
Spread Creek	1,280	.0		.05	64
N. Meadow Cr.	800	.28		.09	72
S. Meadow Cr.	600	.07		.29	174
Star Creek	2,400	.716	.122	Logged	
Ruby Creek	640	.065		.22	141
N. Callahan	1,720	.114		.0	
S. Callahan	2,000	.0		.0	
N. Fk. Keeler	1,840	.218	.176	.016	29
Lower Keeler	500	.933	.303	.06	30
Upper Keeler	4,300	.028		.0	
Benning Creek	1,720	.421	.236	.39	670
Spar Lake	4,960	.149		.0	
Madge Creek	225	1.68		Logged	
Camp Creek	225	.45		Logged	
W. Fk. Quartz Cr.	1,400	.111		.0	
Turner	800	.0		Logged	
Seventeen Mile	1,000	.021		.0	
Bristow Creek	1,120	.058		.0	
N. F. Big Cr.	640	.111		.08	51
Roberts Fork	1,040	No survey		.0	
Bear Creek	2,240	.098		.11	246
Ramsey Creek	2,560	.036		.034	87

Flathead National Forest

Although in the past there have been serious losses within the few white pine stands of the Flathead National Forest, the ranger reports list all infestations as decreasing in severity.

Cabinet National Forest

Ranger reports indicate the mountain pine beetle infestation within the scattered white pine stands of this forest to be in a satisfactory status.

Mountain Pine Beetle Infestation in Lodgepole Pine

Reports of mountain pine beetle infestations in lodgepole pine were received from the Absaroka, Beaverhead, Bitterroot, Flathead, Kootenai, Lolo, and Nezperce Forests of Region 1. Of these reports the situation on the 3-mile and St. Mary's area of the Bitterroot is the only one that is considered as being serious, and the status of this infestation will be checked during the coming field season.

On the Minidoka National Forest in southern Idaho, where a serious infestation of this insect existed a few years ago, the institution of a thorough program of control has left a satisfactory condition. A survey of this forest conducted during the 1940 season shows a light normal infestation in a few small areas only. Potentially dangerous infestations on the Cache National Forest have also been successfully reduced by control.

A rather severe infestation of the mountain pine beetle is present in the lodgepole pine stands in the Grand Teton National Park, where partial control has been conducted during the past two seasons. In the Yellowstone National Park there are some lodgepole pine trees within the utility areas and in stands adjacent to infested areas of whitebark pine that are being killed by these beetles. However, the infestation in lodgepole pine is not considered serious at this time.

Mountain Pine Beetle in Whitebark Pine

Although the epidemic of the mountain pine beetle that has been present within the whitebark pine areas of the northern Rocky Mountain area for the past decade has decreased in severity during the past few years, there is still considerable loss occurring. In some areas the loss of whitebark pine has amounted to as much as 80 percent of the entire stand.

Losses of this tree species are still occurring in the Yellowstone National Park and adjacent areas, although the severity of the infestation is decreasing. Control measures have been directed against an infestation of this insect within the scenic stands at Mammoth. The infestation in this area was due to a spread of beetles from some large blocks of infested trees some few miles away. Although control has prevented the infestation within the utility area from developing to epidemic proportions, it has not eliminated the annual reinfestation from adjacent untreated areas.

Mountain Pine Beetle in Ponderosa Pine

Light infestations of the mountain pine beetle are to be found in the ponderosa pine stands of the Custer, Bitterroot, and Nezperce Forests. Although these situations constitute some potential danger, they are not serious at this time.

Western Pine Beetle (Dendroctonus brevicomis Lec.)
in Ponderosa Pine

In all ponderosa pine stands of Idaho and Montana there is an annual loss of mature trees resulting from attacks of the western pine beetle. The severity of these infestations varies from year to year and for different areas, however, and in some instances the loss becomes quite severe. The importance of the so-called normal infestation of this insect is often underestimated, for over a period of years the loss will often amount to a large percent of the infested stands.

A survey of the Thompson River drainage of Montana during the past season showed no indication of a return to the rather severe infestation which existed some few years ago. However, as outbreaks of this insect develop rapidly from so-called normal situations to epidemic conditions, all areas of mature pine should be kept under constant observation.

There is one small area on the Salmon Forest where the infestation is sufficiently severe to warrant the institution of control. A number of areas on this forest were covered by check surveys during the past season.

Douglas Fir Beetle (Dendroctonus pseudotsugae Hopk.)
in Douglas Fir

Infestations of the Douglas fir beetle are to be found in most all Douglas fir stands of the northern Rocky Mountains. In some areas the associated loss of timber is severe, while in others it is of negligible importance. In localities where this tree species has an immediate commercial value, losses resulting from attacks of the Douglas fir beetle are of economic importance. Although the thoughts of control for this widespread general infestation would seem to be economically impractical, many salvage cuttings have been directed against localized outbreaks.

A number of Douglas fir beetle infestations were reported from different forests during the season. A situation on the Absaroka Forest (Mill Creek) will be examined during the coming season, and control measures were recommended for a severe localized outbreak within a scenic timber stand at Red Fish Lake, Sawtooth National Forest. An increasing infestation was reported from the Tower Falls and Lamar Districts of the Yellowstone Park and from Kintla Lake, Glacier National Park.

Engelmann Spruce Beetle (Dendroctonus engelmannii Hopk.)
in Engelmann Spruce

Light infestations of the Engelmann spruce beetle can nearly always be found in mature stands of Engelmann spruce. From time to time these beetle populations increase to epidemic numbers and severe losses of timber follow. From 1937 to 1939 there were severe outbreaks in many parts of the northern Rocky Mountains, with the greatest destruction occurring in the Yellowstone National Park, where on a large acreage practically all trees above 8 inches in diameter were killed. During the past season a number of infestations of this insect were reported; however, none of them were considered as being serious. The importance of such situations must not be minimized, and all areas of mature timber should be kept under observation for subsequent indications of an increase in the severity of the infestation.

INFESTATION OF FOREST DEFOLIATORS

Hemlock Looper (Ellopiia fiscellaria Guén.)
in Alpine Fir

Epidemic outbreaks of the hemlock looper were recorded from 57 areas in Idaho and Montana during the 1937 season. Although most of these outbreaks only lasted through the 1938 season, during the short period of their existence a large percent of the alpine fir within the defoliated areas died from the injury received. Although the commercial value of the tree species destroyed is of little importance, the fire hazard which this destruction created is a serious consideration. No active infestations of this insect were reported during the past season.

Larch Sawfly (Nematus erichsonii Hartig)

An infestation of the larch sawfly within the larch stands of the Flathead National Forest was reported in 1934. Previous to that time this forest pest had been considered as an eastern insect, for this was the first record of its appearance within the western United States. Since that time these insects have spread southward through the Cabinet National Forest and are now established in several areas on the Coeur d'Alene National Forest. No losses of timber have been recorded.

Spruce Budworm (Harmologa fumiferana Clem.)

An increasing infestation of the spruce budworm was reported from the Big Belt Mountains, Helena National Forest, which is recorded as covering a large acreage with some areas of dead timber. The Nezperce Forest also reports an infestation of this defoliator which, although recorded as general throughout the south fork of the Clearwater River, is considered as decreasing in severity. A decreasing infestation was reported again from the Lolo Forest.

The 1940 forest insect survey program of the Forest Insect Laboratory at Coeur d'Alene, Idaho, started in August and was completed in October. This project included the following areas:

Public Lands	Acres	Man-days	Cost
Coeur d'Alene National Forest	84,350	313	\$1,916.38
Clearwater " "	62,760	81	495.88
St. Joe " "	29,200	65	397.93
Kootenai " "	39,550	190	1,163.38
Kaniksu " "	20,100	34	208.15
Minidoka " "	8,554	74	453.03
Salmon " "	24,800	15	91.90
Sawtooth " "	880	15	91.83
Yellowstone National Park	106,490	25	153.05
Total Public	376,684	812	\$4,971.53
Private Lands			
Clearwater Timber Protective Association	64,360	111	679.54
Potlatch Timber Protective Association	77,600	86	526.49
Thompson River Drainage, Montana	243,000	20	122.44
Total Private	384,960	217	\$1,328.47
Total Public and Private	761,644	1,029	\$6,300.00

This program was directed towards obtaining information concerning the status of known infestation, as well as to guard against the development of others, and included five different timber types as shown in the following tabulation:

Forest type	Total acres	Acres surveyed	Percent of total
Western white pine	1,823,179	377,920	20.7
Ponderosa pine	4,292,566	267,800	6.2
Lodgepole pine	7,319,374	115,044	1.6
Douglas fir	2,203,371	880	.04
Engelmann spruce	437,427	3,061	.7
(pure stands only)			

As will be seen, the percent of this timbered acreage actually covered by surveys can not be expected to provide data upon which adequate protection can be based. Although 20 percent of the total acreage of white pine was included in this year's program, the work on some areas was so extensive that the survey was but little more than an examination. A material increase in survey activities is necessary to provide a satisfactory coverage of forest lands. Data obtained during the past season indicate a fairly satisfactory condition in all areas covered. Control measures were recommended for two "hot spots" of mountain pine beetle infestation within the white pine stands of the Coeur d'Alene and Clearwater National Forests, for an infestation of the same insect in lodgepole pine on the Grand Teton National Park, and for an outbreak of the Douglas fir beetle in Douglas fir on the Sawtooth National Forest.

The 1940 forest insect survey program of the Forest Insect Laboratory at Great Smoky Mountains National Park was completed in October. This project included the following items:

Public Lands			Private Lands		
Great Smoky Mountains National Forest	10,350	111	Cherokee Indian Reservation	6,750	111
Cherokee National Forest	12,750	85	Cherokee Indian Reservation	7,500	85
Sevier National Forest	22,500	85	Cherokee Indian Reservation	7,500	85
Roanoke National Forest	18,500	100	Cherokee Indian Reservation	7,500	85
Lincoln National Forest	20,100	75	Cherokee Indian Reservation	7,500	85
Watauga National Forest	2,500	75	Cherokee Indian Reservation	7,500	85
Shannon National Forest	24,500	15	Cherokee Indian Reservation	7,500	85
Smoky Mountains National Forest	250	15	Cherokee Indian Reservation	7,500	85
Yellowstone National Park	100,400	25	Cherokee Indian Reservation	7,500	85
Total Public	170,850	815	Total Private	1,000	1,000
Total Public and Private			Total Public and Private		
170,850	815	1,000	1,000	1,000	1,000

This program was directed towards obtaining information concerning the status of known infestations, as well as to search for new infestations of insects, and included five different types of work in the following categories:

Forest type	Total acres	Acres surveyed	Total
Western white pine	1,875,150	375,000	50.7
Ponderosa pine	1,750,500	350,000	8.5
Lodgepole pine	7,710,370	1,150,000	1.8
Douglas fir	2,201,371	450,000	.09
Engelmann spruce	1,571,457	1,001,000	.7
(pine stands only)			

As will be seen, the percent of this forest area actually covered by survey was not as expected to provide data upon which adequate protection can be based. Although 50 percent of the total area of white pine was included in this year's program, the work on these areas was not extensive. The survey was not able to cover more than an estimated 10 percent of the area. A material increase in survey activities is necessary to provide a satisfactory coverage of forest lands. The objectives during the past season included a fairly satisfactory coverage in all areas covered. Control measures were recommended for two "hot spots" of white pine beetle infestation within the white pine stands of the Great Smoky Mountains National Forest. For an infestation of the same forest in lodgepole pine on the Great Smoky Mountains National Forest, and for an infestation of the Douglas fir beetle in Douglas fir on the Smoky Mountains National Forest.